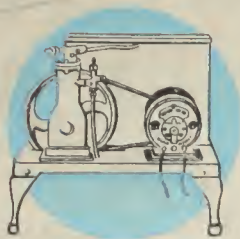


AUG 4 1924

Copeland

ICELESS REFRIGERATION~



BULLETIN 201

Prepared by
COPELAND PRODUCTS, Incorporated
FLINT, MICHIGAN

Copeland Iceless Refrigerator vs. Ice

THE objective of modern housekeeping is the entire elimination of labor, and perfect sanitary conditions. There is an ever increasing demand for electrically operated domestic ice machines because they have such advantages. This is particularly true of the COPELAND. It not only eliminates the ice man and operates automatically without attention except for an occasional oiling, but it is also cheaper, cleaner and refrigerates better than ice.



Typical Copeland Installation

General Description—The COPELAND REFRIGERATING SYSTEM is made up of six units:

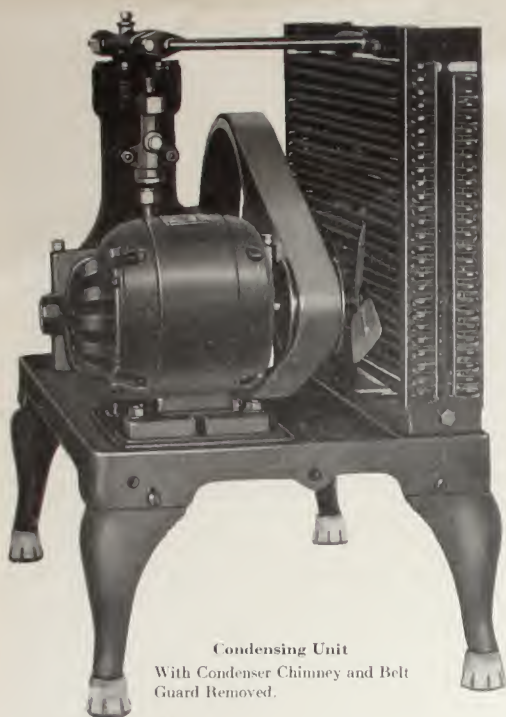
- 1—Compressor: Compresses the refrigerant gas to the point of liquefaction.
- 2—Condenser: Cools the refrigerant after compression.
- 3—Expansion Valve: Regulates the flow of the refrigerant into the coils of the brine tank.
- 4—Brine Tank: Absorbs the heat from the air inside the refrigerator.
- 5—Motor: Drives the compressor and also a fan for air circulation in condenser.
- 6—Thermostat: Governs the temperature of the brine tank by regulating the operation of the refrigerating unit.

Compressor—The COPELAND compressor is designed and constructed to last for years, thereby eliminating to a large extent the necessity for repairs. The lubricant is a mixture of special oil and graphite which is usable for a period of over six years. The compressor is of the single cylinder, single acting type, equipped with replaceable cylinder sleeve and an oil sealed "feather" valve. It is practically noiseless, efficient and not subject to leakage through wear. The ordinary stuffing box construction has been replaced with a specially designed "gas seal" of anti-friction metal.



Compressor

Condenser—The condenser is made up of two separate coils of $\frac{1}{2}$ " tubing. The intake and exhaust of both coils are sweated into a common header. Each coil is forty-five feet long; the total amount of radiating surface being $14\frac{3}{4}$ square feet. The coils are spirally wound on a rectangular form and completely enclosed by a metal flue, with the exception of the opening for the 6" fan. The fan is mounted directly on the motor shaft and creates forced air circulation over the condenser tubing.



Condensing Unit
With Condenser Chimney and Belt
Guard Removed.

Expansion Valve—The refrigerant, which is in liquid form on account of being under pressure, is admitted into the coils in the brine tank through an automatic expansion valve. The pressure of the refrigerant after passing through the expansion valve gradually drops into a vacuum of 10" at the lower end of the coils, under which condition it boils at the temperature of 10 degrees "F." The expansion valve is of the balanced type. When the pressure on the lower side is increased by the boiling of the refrigerant, this reacts against the pressure on the higher side, which automatically shuts off the supply of the refrigerant entering the expansion valve. When the pressure on the lower side is again reduced this automatically opens the expansion valve, thereby admitting a quantity of liquid refrigerant.



Expansion Valve

Brine Tank—The brine tank contains the evaporation coils and is filled with a solution of denatured alcohol and water. The evaporation coils are so arranged in connection with baffles that there is a positive and complete circulation of brine through the tank. The top of the brine tank is sloped so that it can be completely filled with solution, eliminating the possibility of air pockets, thereby utilizing all the cooling surface. It is also

equipped with one large compartment in which ice trays, or other receptacles for freezing liquids, can be placed. This compartment is covered with a door which excludes moisture, consequently trays or receptacles do not freeze fast to the side walls or floor of the compartment. They can always be easily removed.



Brine Tank

Ice Cubes—Two or three ice trays, depending upon the size of brine tank, are supplied as standard equipment. Each tray has a capacity of fifteen cubes, each cube being approximately $1\frac{5}{8}$ " square. The partitions between the cubes are made of extra heavy metal which insures them against damage when the cubes are removed. These trays are mounted on rails and can be easily removed and replaced by other receptacles, if desired.

The sizes of the compartment, after the trays have been removed, are as follows:

| SIZE | DIMENSION OF COMPARTMENT |
|-------------|--|
| 60 | 4" x $5\frac{3}{4}$ " x $9\frac{3}{8}$ " |
| 106 | $5\frac{3}{4}$ " x $5\frac{3}{4}$ " x $9\frac{5}{8}$ " |
| 1410 | $5\frac{3}{4}$ " x $5\frac{3}{4}$ " x $9\frac{5}{8}$ " |
| 10 Special. | 4" x $5\frac{3}{4}$ " x $9\frac{3}{8}$ " |
| 14 Special. | 4" x $5\frac{3}{4}$ " x $9\frac{3}{8}$ " |

Size and Capacity—The COPELAND is, at present, supplied with only three standard brine tanks:

SIZE 60—Equivalent to fifty pounds of melting ice each twenty-four hours' continuous operation. It has the capacity for refrigerating six cubic feet; over-all dimensions of the brine tank are 10" x 12" x 13".

SIZE 106—Equivalent to seventy-five pounds of melting ice each twenty-four hours' continuous operation. It has the capacity for refrigerating six to ten cubic feet; over-all dimensions of the brine tank are 10" x 13" x 15".

SIZE 1410—Equivalent to one hundred pounds of melting ice each twenty-four hours' continuous operation. It has the capacity for refrigerating ten to fourteen cubic feet; over-all dimensions of the brine tank are 11" x 13" x 17".

SIZE 10 Special—For Top Icer—Equivalent to seventy-five pounds of melting ice each twenty-four hours continuous operation. It has the capacity for refrigerating up to ten cubic feet; over-all dimensions of the brine tank are 16" x 12" x $7\frac{1}{2}$ ".

SIZE 14 Special—For Top Icer—Equivalent to one hundred pounds of melting ice each twenty-four hours continuous operation. It has the capacity for refrigerating ten to fourteen cubic feet; over-all dimensions of the brine tank are 21" x 14" x 7½".

Thermostat—This is self contained, direct connected to a quick-make and break switch element. It is of the Siphon type, which is a corrugated metal bellows filled with gas.

The pressure of the gas changes with differences in temperature. The thermostat itself is located in a suitable container in the brine tank.



Thermostat

This container is kept partly filled with denatured alcohol so there will be a direct heat transfer and consequently contact between the thermostat and the brine. It is actuated by the temperature of the brine so that ice can be made at all times regardless of outside temperatures.

Motor—The motor used is ½ H. P. and can be supplied for both AC and DC current from 110 to 220 Volts, and 25, 30, 40, 50 or 60 cycle current. The motor is placed on a base which is under spring tension, insuring automatic take-up in the belt, eliminating the belt tightener or idler. The spring tension is capable of taking care of 1½" belt stretch. The motor base is also slotted so that the motor can be moved, providing for an additional 1½" belt stretch. The belt will be 1½" wide by ⅝" thick, made up of water proof, oak tanned, center stock, and spliced by a 6" lap. This size of belt is sufficient for double the capacity required.

Temperature—The COPELAND REFRIGERATING SYSTEM will maintain a temperature in any good grade of refrigerator of less than fifty degrees "F." The temperature in the different compartments varies with the outside temperature and with the construction of the refrigerator. The mean temperature maintained in the brine tank is approximately twenty-six degrees.



Condensing Unit

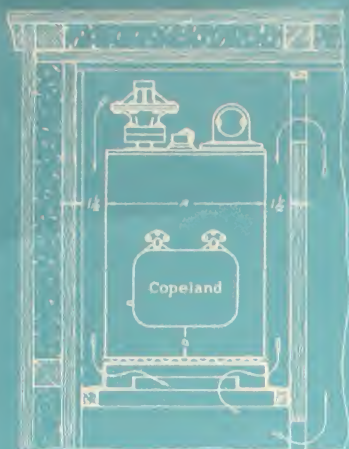
Upkeep—The actual operating time of the compressor varies with the outside temperature, the frequency with which the doors are opened, the quality of the refrigerator, and the size of the brine tank. With outside temperature better than 50°F the average operating time is eight hours per day. Under these conditions the total power consumption will vary from 1½ to 2 Kilowatt hours per day. In nearly every instance the daily operating cost of the COPELAND is less than the cost of ice.

Installation and Service—Installation is made by well trained mechanics under the jurisdiction of reliable dealers who are appointed by the factory. The factory will also indirectly maintain and supervise service for all COPELAND INSTALLATIONS wherever made.

Guarantee—Every COPELAND installation is serviced by experienced mechanics for a period of three months after installation without cost to the customer. All units or parts will be replaced f. o. b. factory, if found defective within one year after installation, provided immediate notice is given the dealer.

Condensed Table of Data

| SIZE | Maximum Cubic Contents of Refrigerator in Feet | Equivalent in Pounds of Melting Ice per Day | Maximum Connected Load in Watts | Ice-Cube Capacity | Overall Dimensions in Inches of Brine Tank and Attachments | | | Recommended Dimensions in Inches of Brine Tank Compartment | | | Overall Dimensions in Inches of Machine | | | |
|---------|--|---|---------------------------------|-------------------|--|-----------------------|--------|--|-------|--------|---|--------|--------------------|-----------------------|
| | | | | | Width (Front) | Depth (Front to Rear) | Height | Width | Depth | Height | Width | Length | Height (With Legs) | Height (Without Legs) |
| 60 | 6 | 50 | 220 | 30 | 10 | 12 | 17¾ | 12 | 14 | 18 | 15 | 26 | 23⅝ | 16¾ |
| 106 | 10 | 75 | 220 | 45 | 10 | 12½ | 19¾ | 12 | 15 | 20 | 15 | 26 | 23⅝ | 16¾ |
| 1410 | 14 | 100 | 220 | 45 | 11 | 13½ | 21¼ | 13 | 16 | 22 | 15 | 26 | 23⅝ | 16¾ |
| SPECIAL | | | | | | | | | | | | | | |
| 10 | 10 | 75 | 220 | 30 | 16 | 12 | 11¾ | 18 | 11 | 12½ | 15 | 26 | 23⅝ | 16¾ |
| 14 | 14 | 100 | 220 | 30 | 21 | 14 | 11¾ | 23 | 16 | 12½ | 15 | 26 | 23⅝ | 16¾ |



CLEARANCE DIMENSIONS
SHOWN ARE RECOMMEN-
DED AS MINIMUM FOR
PROPER AIR CIRCULATION



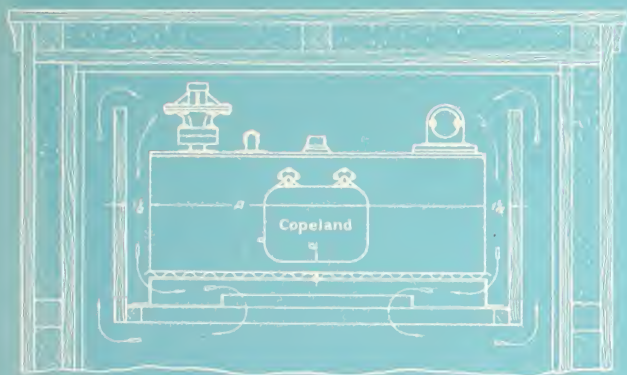
SIDE ICER

TANK SIZES

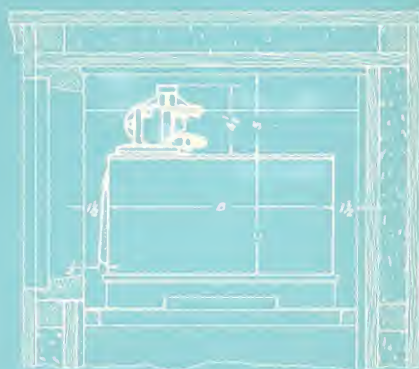
| | | |
|------------|------------|------------|
| NO. 60 | NO. 105 | NO. 140 |
| A - 10" | A - 10" | A - 14" |
| B - 12" | B - 12" | B - 13" |
| C - 15" | C - 15" | C - 17" |
| D - 1 1/2" | D - 1 1/2" | D - 1 1/2" |

REFRIGERATING CAPACITY

| |
|-------------------------|
| NO. 60 - 0.6 CU. FT. |
| NO. 105 - 5.10 CU. FT. |
| NO. 140 - 10.14 CU. FT. |



CLEARANCE DIMENSIONS SHOWN
ARE RECOMMENDED AS MINIMUM
FOR PROPER AIR CIRCULATION



TOP ICER

| | |
|------------|------------|
| NO. 10 | NO. 14 |
| A - 10" | A - 21" |
| B - 12" | B - 14" |
| C - 15" | C - 17" |
| D - 1 1/2" | D - 1 1/2" |

REFRIGERATING CAPACITY

| |
|------------------------|
| NO. 10 - 0.6 CU. FT. |
| NO. 14 - 10.14 CU. FT. |